

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) Method for ~~detection of~~ detecting contamination by specific microorganisms in a sample, comprising: ~~through the application of the evanescent field of a sensitive fiber optic characterized by the stages of:~~

(a) ~~exposing the~~ an evanescent-field of ~~the~~ a sensitive fiber optic by removing at least a portion of a primary covering of and reducing a thickness of a sheath of said fiber optic using an appropriate technique based on physical and chemical properties;

(b) ~~permitting the immediate contact of~~ contacting the exposed evanescent-field ~~obtained in the stage (a) with the~~ with a sample to be examined, with the ~~aforementioned said~~ sample having a form adequate so as to ~~obtain the generation of~~ generate an optical signal in response to the presence of microorganisms in the ~~sample:~~ sample;

(c) demodulating the optical signal generated in stage (b) and using this value to quantify the microorganisms ~~through an appropriate method.~~

2. (currently amended) Method in accordance with claim 1 wherein ~~the appropriate technique~~ said reducing of the thickness of the sheath of said optical fiber for stage (a) ~~is~~ includes chemical etching performed with a strong acid.

3. (original) Method in accordance with claim 2 wherein the strong acid is hydrofluoric acid.

4. (currently amended) Method in accordance with claim 3 wherein ~~the~~ a time of ~~treatment~~ chemical etching and ~~the~~ a concentration of the hydrofluoric acid ~~solution is~~ are adjusted in a manner to permit the etching of the sheath of the fiber optic until it approaches a thickness of ~~0.5~~ 0.5 to 1 μm from ~~the~~ a core of said fiber optic.

5. (currently amended) Method in accordance with claim 4 wherein the time of ~~treatment~~ said chemical etching is 11 minutes and the concentration of the acid is 38%.

6. (currently amended) Method in accordance with claim 1 wherein the sample to be examined is in a support containing ~~the~~ a culture medium appropriate to permit the growth of microorganisms.

7. (original) Method in accordance with claim 6 wherein the support is a Petri dish containing Agar medium and specific nutrients.

8. (currently amended) Method in accordance with claim 6 wherein reactants are incorporated to the culture medium capable of altering the properties of the culture medium in a manner as to permit a better detection of ~~the~~ an index of refraction of the microorganisms.

9. (currently amended) Method in accordance with claim 1 wherein the sensitive fiber has integrated to itself one or more concentric layers of a material selected from the group consisting of dielectricals, metallics, superconductors or semiconductors in a manner so as to alter the transversal spatial distribution of the evanescent-field and thus optimizing ~~the contact with~~ the a medium containing the specific microorganism.

10. (original) Method in accordance with claim 9 wherein the material is a polymer selected from a group consisting of polyvinyl chloride, polyurethanes, polyureas and polyesters.

11. (currently amended) Method in accordance with claim 1 ~~wherein the further comprising monitoring contamination by specific microorganisms of the environment is to occur~~ in real time.

Claims 12 and 13. (canceled).

14. (currently amended) Device for ~~the survey of~~ surveying microorganisms through ~~the~~ insertion of a sensitive fiber optic ~~(11)~~, with an adequately exposed evanescent-field, into a surface or volume of a biological culture medium ~~(12)~~ specific for ~~the~~ a microorganism to be detected, ~~characterized by comprising the following a~~ system for demodulation based on a fiber optic circuit including; ~~and related components:~~

an optical source; a 2x1 fiber optic coupling; a 2x2 fiber optic coupling; ~~source (1), coupling to an optical fiber of the 2x1 type (2), coupling to an optical fiber of the 2x2 type (5), an a first~~ optical fiber extension ~~(8)~~ termed sensitive element containing a first polarization controller ~~(10)~~, a segment of sensitive optical fiber ~~(11)~~ with ~~the~~ exposed evanescent-field being in direct physical contact with ~~the~~ a biological culture medium ~~(12)~~; and a first ~~an~~ extremity ~~(15)~~ from which ~~exits the light exits to a first that enters the~~ photodetector ~~(16)~~; ~~another~~; a second ~~extension of optical fiber extension (9)~~ termed reference element containing a second polarization controller ~~(17)~~; and an a second extremity ~~(18)~~ from which ~~exits the light exits to a second that enters the~~ photodetector ~~(19)~~ in a manner as to compose a device that functions based on ~~the~~ modulation of ~~the~~ light intensity (or amplitude) of light.

15. (currently amended) Device for ~~the survey of~~ surveying microorganisms through ~~the~~ insertion of a sensitive fiber optic ~~(11)~~, with an adequately exposed evanescent-field, into a surface or volume of a biological culture medium ~~(12)~~ specific for ~~the~~ a microorganism to be detected, ~~characterized by comprising the following a~~ system for demodulation based on a fiber optic circuit including; ~~and related components:~~

i) ~~an~~ optical source ~~(1)~~; ~~coupling to an~~; a 2x1 optical fiber optic coupling; ~~of the 2x1 type (2)~~; ~~coupling to an~~; a 2x2 optical fiber optic coupling; ~~of the 2x2 type (5)~~; an a first optical fiber extension ~~(8)~~ termed sensitive element containing a first polarization controller ~~(10)~~, two connection links ~~(13 and 14)~~, a segment of sensitive optical fiber ~~(11)~~ with ~~the~~ exposed evanescent-field being in direct physical contact with ~~the~~ a

biological culture medium-(12) and having ~~both~~ two semi-reflective extremities-localized at points (13) and (14), ~~an~~ , a first extremity-(15) from which ~~exits the light exits to that enters the~~ a first photodetector; ~~-(16)~~ a second, another extension of optical fiber extension-(9) termed reference element containing a second polarization controller-(17), and ~~an~~ a second extremity-(18) from which ~~exits the light exits to that enters the~~ a second photodetector-(19) in a manner as to compose a device that functions based on the modulation of ~~the~~ a complete phase of light of ~~the~~ a Fabry-Perot type interferometer.

16. (currently amended) Device for ~~the survey of~~ surveying microorganisms through ~~the~~ insertion of a sensitive fiber optic-(11), with an adequately exposed evanescent-field, into a surface or volume of a biological culture medium-(12) specific for the microorganism to be detected, ~~characterized by comprising the following a~~ system for demodulation based on a fiber optic circuit including; and related components:

an optical source-(1), ~~coupling to an~~; a 2x1 optical-fiber optic coupling; ~~of the 2x1 type (2), coupling to an~~ a 2x2 optical-fiber optic coupling; ~~of the 2x2 type (5)~~ a first, an optical fiber extension-(8) termed sensitive element containing a first polarization controller-(10), a segment of sensitive optical fiber-(11) with the exposed evanescent-field being in direct physical contact with ~~the~~ a biological culture medium-(12), ~~an~~ , and a first extremity of reflective optical fiber-(15), ~~another~~ ; a second extension of optical fiber (9) termed reference element containing a second polarization controller-(17) and a second extremity of reflective optical fiber-(18), ~~an~~ ; a third extremity of optical fiber-(3) from which ~~exits the light exits to that enters the~~ a first photodetector-(4) and ~~an~~ a fourth ~~second~~ extremity of optical fiber-(6) from which ~~exits the light exits to that enters the~~ a second photodetector-(7) in a manner as to compose a device that functions based on the modulation of ~~the~~ a complete light phase of ~~the~~ a Michelson type interferometer.

17. (currently amended) Device for ~~the survey of~~ surveying microorganisms through ~~the~~ insertion of a sensitive fiber optic-(11), with an adequately exposed evanescent-field, into a surface or volume of a biological culture medium-(12) specific

for ~~the~~ a microorganism to be detected, ~~characterized by comprising the following a~~
system for demodulation based on a fiber optic circuit ~~and related components~~;
including:

an optical source (1); a 2x1, coupling to an optical fiber optic coupling; of the 2x1
type (2) a first 2x2, coupling to an optical fiber optic coupling; of the 2x2 type (5), an a
first optical fiber extension (8) termed sensitive element containing a first polarization
controller (10), a segment of sensitive optical fiber (11) with the an exposed
evanescent-field being in direct physical contact with the a biological culture medium,
medium (12), an a first extremity of optical fiber (15) directly linked to the a second
extremity of optical fiber (21) belonging to the a second 2x2 coupling of the optical fiber
optic coupling; of the 2x2 type (20), an and a third extremity of optical fiber (25) from
which exits the light exits to that enters the a first photodetector (23); a second, another
extension of optical fiber (9) termed reference element containing a second polarization
controller (17), an and a fourth extremity of optical fiber (18) directly linked to the a fifth
extremity of optical fiber (22) belonging to said second 2x2 fiber optic coupling, and an a
sixth extremity of optical fiber (26) from which exits the light exits to that enters the
detector a second photodetector (24) in a manner as to compose a device that functions
based on the modulation of the a complete light phase of the a Mach-Zehnder type
interferometer.

18. (currently amended) Device in accordance with claim 14 wherein the
sensitive optical fiber (11) contains a Bragg grating engraved within its core in a manner
as to compose a device that functions based on the modulation of the length of the light
wave.

19. (currently amended) Device in accordance with claim 14 wherein the
sensitive optical fiber (11) consists of a high birefringency fiber of the type that
maintains polarization in such a manner as to compose a device that functions based
on the modulation of the polarization of light.

20. (currently amended) Device in accordance with claim 14 wherein the sensitive optical fiber ~~(11)~~ consists of a high birefringency fiber of the type that maintains polarization containing a Bragg grating engraved within its core in a manner as to compose a device that functions based on the modulation of the length of the light wave and/or light polarization.

21. (new) Method in accordance with claim 6 wherein the sensitive fiber has integrated to itself one or more concentric layers of a material selected from the group consisting of dielectricals, metallics, superconductors or semiconductors in a manner so as to alter the transversal spatial distribution of the evanescent-field and thus optimizing the contact with the medium containing the specific microorganism.

22. (new) Device in accordance with claim 15 wherein the sensitive optical fiber contains a Bragg grating engraved within its core in a manner as to compose a device that functions based on the modulation of the length of the light wave.

23. (new) Device in accordance with claim 16 wherein the sensitive optical fiber contains a Bragg grating engraved within its core in a manner as to compose a device that functions based on the modulation of the length of the light wave.

24. (new) Device in accordance with claim 15 wherein the sensitive optical fiber consists of a high birefringency fiber of the type that maintains polarization in such a manner as to compose a device that functions based on the modulation of the polarization of light.

25. (new) Device in accordance with claim 16 wherein the sensitive optical fiber consists of a high birefringency fiber of the type that maintains polarization in such a manner as to compose a device that functions based on the modulation of the polarization of light.

26. (new) Device in accordance with claim 17 wherein the sensitive optical fiber consists of a high birefringency fiber of the type that maintains polarization in such a manner as to compose a device that functions based on the modulation of the polarization of light.

27. (new) Device in accordance with claim 15 wherein the sensitive optical fiber consists of a high birefringency fiber of the type that maintains polarization containing a Bragg grating engraved within its core in a manner as to compose a device that functions based on the modulation of the length of the light wave and/or light polarization.

28. (new) Device in accordance with claim 16 wherein the sensitive optical fiber consists of a high birefringency fiber of the type that maintains polarization containing a Bragg grating engraved within its core in a manner as to compose a device that functions based on the modulation of the length of the light wave and/or light polarization.

29. (new) Device in accordance with claim 17 wherein the sensitive optical fiber consists of a high birefringency fiber of the type that maintains polarization containing a Bragg grating engraved within its core in a manner as to compose a device that functions based on the modulation of the length of the light wave and/or light polarization.